The Minimum Average Print Run in Publication Printing? A Paradigm Shift in Publication Printing!

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During the last decade there have been many changes in the European media market. In particular during the last two to three years advertising money in many national markets has been reallocated from the traditional printed media to the Web. This will also undoubtedly affect the publication printing market, which was pointed out by Bjurstedt (2006, 2007). The larger publication gravure printers have been suffering from lower volumes and shorter runs for considerable time, but those working in the smaller segments of the market seem to perform better.

All forecasts suggested by larger publishers and catalogue producers state that publication printers must be able to handle shorter runs with high demands on both print quality and tight turnaround schedules. The needs and demands of the customers have to be very carefully studied and comprehended by all publication printers.

A number of European publication printers and most of the suppliers in plate and cylinder making equipment were approached in 2005–2008, and most of the results were published by Bjurstedt (2005, 2006, 2007 and 2008). The research methodology used in this paper is both quantitative and qualitative with a survey approach extended with personal interviews. The interviewees have been selected among the most leading publication printers and suppliers to the industry. Today, there are not more than about four or five leading suppliers to the industry (plate and printing cylinder processing equipment manufacturers). The data collected has been recently been updated and used in several simulation models developed by the author.

Previously, the turnaround (cycle) time for offset plate making in modern CTP devices have been extremely short in relation to gravure cylinder processing, allowing the user-printer to produce very short runs, albeit not always economical in relation to, i.e., sheetfed offset printing. All engraving technologies—using mechanical or laser technology—is surface dependent. Plate exposure using modern CTP technology is also surface (or rather plate-length) dependent.

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The minimum average print run (or MAPR for short) in commercial web offset is very low, approximately less than 10,000 copies (Bjurstedt, 2008), whilst in publication gravure using three mechanical engraving and standard plating lines the MAPR is typically around 400–450,000 copies for 64-A4-page signatures (supporting a modern high-speed gravure press). Most publication gravure printers, however, have typically more than one gravure press which creates a more complex simulation model.

Yet another complicating factor is the flexibility of modern gravure presses to print not only 4 pages around (as in all larger commercial web offset presses) but also 6 around or even 8 pages around (however, the speed of the web is always constant, reducing the number of revolutions accordingly). Hence, the cycle time for gravure cylinders is increased accordingly, but this is offset by the lower number of revolutions using 6 pages around in the gravure printing press.

With all those facts in mind is it not surprising to find, that both suppliers of engraving technologies have strived to shorten the cycle time in cylinder processing. Recently, the major supplier of engraving machines has launched an improvement package, cutting both the calibration time and introducing engraving heads using higher engraving frequency. Despite a total reduction of the present cycle time with 20–25%, the MAPR is only reduced by approximately 100,000 copies. But the MAPR would be even lower if in this context the laser engraving technology is used.

In an interview in the June 2008 issue of German trade magazine, the *Deutscher Drucker,* the CEO of Prinovis, Mr Stephan Krauss stated that "A quantum leap in reducing the cost for processing gravure cylinders is needed. We have to reduce the costs with up 20–30–40%." Publication printing in Europe, however, has a very large magazine market to supply, but it is quite surprising to find that almost 90% of the European magazine titles has a circulation of 500,000 copies or less. The logical question for a gravure printers would then be—why chrome plate cylinders to withstand millions of copies (cylinder revolutions) when the print runs are much lower than half a million? Not only would the cycle time be drastically reduced, also the processing costs for gravure cylinders would be cut to a great extent. This would seem to be a true Alexandrian solution!

Chrome plating gravure cylinders does have a quite long tradition, but it was not until the end of the 1960s when chrome plating became a standard procedure in cylinder processing. There were many very large magazines and catalogues with increasing and huge circulations which demanded a long life cylinder, particularly in the U.S., the U.K., and Germany; hence the chrome plating process was introduced. Notwithstanding, many smaller gravure printers etched the cylinders

and the soft copper used at the time could withstand runs up to a quarter of million impressions. In the late 1970s when mechanical engraving was introduced, a much harder and brittle copper surface was needed, hence chrome plating was indispensable. Lately, the chrome plating industry—including the gravure industry—has become the target of the European Commission environmentalists demanding much tighter exposure and safety measures than normally is the case.

In Bjurstedt (2007) some other ideas of improving the MAPR for publication gravure were put forward using the Double Ender (DE for short) concept for short runs in gravure. The DE concept is only 4 printing units with a half-width paper web—typically using 125-cm web to produce 32, 48 or even 64 pages (A4 format or close). Engraving only four cylinders is of course reducing the cycle time tremendously—but not as one could expect with 50%, but only with about 30–35% depending on the complexity of cylinder processing (engraving/ cleaning/chrome plating and polishing). With the current enhanced simulation model developed by the author combined with newly developed flow-charts showing the individual cycle time for each process, it is comprehensible to deduce that eliminating the chrome plating process and using the DE concept, the cycle time would be reduced by almost 65%—from about 4–5 hrs for 8 cylinders using the most modern mechanical process to less than 90 minutes for the laser alternative, comparing in this case 64-page signatures.

It has to be noted, however, that using a new alloy—replacing copper/ chrome plating combination (for mechanical engraving), zinc/chrome plating combination—needs by default to be a laser solution. A mechanical engraving solution is not visible in this context. The MAPR would be in the vicinity of 40,000 copies or less, and to achieve these levels the cylinder processing department needs to be fully integrated into the press room activities. All cylinder handling has to be fully automated and never touched or manually intervened.

A slightly more powerful laser engraving cylinders on a new surface would be able to finish about four cylinders (each a 32-A4-page form) in less than 60 minutes would be one step in the right position. For those markets with an annual demand less than 20,000 tons of paper, such as in Scandinavia, Switzerland and other small European markets, a DE gravure press in combination with the new chrome-less laser concept, a MAPR of less than 20–30,000 copies is feasible depending on the width of the press (number of pages to be printed) chosen. For those markets with a demand of 30–40,000 tons of paper and very short runs there is a choice between a solution with a twin DE gravure press or a more conventional 8-unit gravure press, both alternatives in combination with the chrome-less laser alternative. It has been shown by Bjurstedt (2007) that gravure, compared with commercial web offset when printing a 64-page signature, is indeed always cheaper. Hence, both technical and economical factors would favour gravure printing.

Depending on the market situation and the MAPR in question, the choice would be quite straightforward. Such a solution would also create a revival of the publication gravure industry, and create new business opportunities for those bold printers because the gravure process gives the producer (and of course the print buyer) many other advantages; flexibility in choosing the optimum format and pagination, flexibility in choosing the paper grade (improved newsprint, SC magazine paper or LWC) as well as an environmentally friendly process.

What strategies should a publication gravure printer use in order to survive in a most competitive European or North American print market? Would it be possible to improve the gravure cylinders processing to an extent where the MAPR levels for publication gravure would be in the same vicinity as commercial web offset plate making? If gravure cylinders and web offset plate making would become similar in turn-around cycles and financial requirements, it would constitute a paradigm shift in the publication printing industry. If a break-through in developing a completely new process would occur for processing gravure cylinders, it would be an indication that such a paradigm shift in the publication printing markets may be under way. This would also open up a potential structural change in the industry, such as housing third party suppliers of gravure cylinders to be located in the printing houses allowing very short delivery cycles, when and if those changes in the technology would occur.

References

Bjurstedt, A., 2006. "Benchmarking gravure cylinders vs. web offset plates." *Advances in Printing and Media Technology,* Vol. XXXII, Zagreb, 2006, pp. 71–89.

Bjurstedt, A., 2007. "Is there a future for the European Publication printing industry?" *TAGA 2007 Proceedings,* Sewickley, 2007, USA.

Bjurstedt, A., 2007. "Gravure vs. web offset. A changing world in publication printing 1986–2006." Doctoral Thesis, Royal Institute of Technology, Stockholm, Sweden.

Bjurstedt, A. 2008. "Removing the constraints of publication printing." *Advances in Printing and Media Technology,* Vol. XXXV, Zagreb, 2009, pp. 137–145.

Krauss, S. 2008 *"Die Last der Energiepreisen können wir nicht alleine tragen"* in German. *The Deutscher Drucker* Nr. 23/26.62008.

Kuhn, T.S., 1962. *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, USA.